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Cruise missile flaws found

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WASHINGTON — Three reports prepared secretly by the congressional General Accounting Office (GAO) warn that the new cruise missiles about to join the American arsenal may not be accurate enough to hit their assigned targets in the Soviet Union.

The recently declassified reports are particularly significant because the cruise missile is considered the key weapon to fill the gap left in American defenses by former President Jimmy Carter's decision not to build the B-1 bomber.

The GAO scientists and engineers were particularly critical of the complicated guidance system for the missile. Pentagon officials long have said the U.S. was clearly well ahead of the Soviet Union in cruise missile technology.

But the GAO questioned whether that technology will work under wartime conditions when the missiles are supposed to guide themselves in flight by comparing the terrain passing below against a "map" stored in an on-board computer.

Roughly 6,000 cruise missiles are expected to join U.S. forces soon. Equipped with both nuclear and conventional warheads, the drones will be carried aboard submarines, surface ships, airplanes, and ground launchers. First delivery is scheduled for the Air Force in December. By late 1983 the missiles are to be deployed in Europe where they will play a major role in future arms control formulas.

THE STUDY FOUND two potentially dangerous flaws in the terrain contour

matching (TERCOM) guidance system that is the heart of the air-launched (AECM), sea-launched (SLCM), and ground-launched (GLCM) versions of the cruise missile:

- The system's radar sensors are easily confused by snow on the ground, by seasonal changes as leaves come and go on trees, and by the monotonous expanses of the Russian flatlands known as the steppes.

- United States intelligence has failed to provide accurate details about the contours of landmarks in parts of the Soviet Union for the cruise missile computers.

The GAO experts charged that the military moved too quickly to start producing the missiles when the sophisticated system of radar altimeters, barometers, and computers had been tested only over familiar terrain near Point Mugu, Cal., where there are practically no trees, little snowfall, and a gentle, rolling terrain.

CRUISE MISSILES are relatively inexpensive weapons consisting of a small jet engine, stubby wings, and a guidance system that takes radar readings periodically to determine the contours of the ground below.

For example, noted one of the GAO reports, the Pentagon's Defense Mapping Agency (DMA) has prepared extensive maps of the "Moscow-Leningrad route" and programmed them into cruise missile computer memories.

Flying at subsonic speeds a few hundred feet off the ground, the missile gets its first heading by comparing the maps in its memory with a rather large patch of Soviet ground as it first crosses the

border or shoreline. This initial "map" is of ground about 25 miles wide, the GAO disclosed.

Often during its flight the missile checks its computer memory with radar readings of the ground below. Each time a patch of ground jibes with the computer map, the missile changes direction and heads for its next checkpoint until a final reading is taken and the drone aircraft dives for its target.

THE GAO MADE these warnings in a report originally stamped "secret" but declassified at the request of the Project on Military Procurement, a private group of tax reform advocates. The report said:

"The need to determine the precise effect of trees and snow on TERCOM is important because about half of the Soviet land mass is covered with forests. The area surrounding the Leningrad-to-Moscow flight path, which includes approximately (deleted) per cent of the targets in the National Target Base, is heavily forested and has annual rainfall and snowfall of 16 to 40 inches. The greater portion of the area has an average of at least 120 days per year with snow on the ground."

Thus, warned the GAO report, "If the TERCOM computer contained the actual ground terrain and the radar sensed the tops of the trees over a large portion of the update area, TERCOM again might not correlate correctly."

Similarly, if the missile's computer showed a flat area but if that area was covered with a snowdrift as the drone passed over, the guidance system would fail and the missile would fly off course.

ANOTHER PREVIOUSLY unmentioned drawback to the cruise missile plan is that the DMA experts encountered problems when they began producing the expensive maps needed for the missile

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